# Authoring M-Learning Content: A Case Study of Using Microsoft PowerPoint Mobile Learning Content Development

Nana Kofi ANNAN<sup>1</sup>, Morten FALCH<sup>2</sup>, George OFORI-DWUMFUO<sup>3</sup> <sup>1,2</sup> Centre for Communication, Media and Information Technologies (CMI) Aalborg University Lautrupvang 4a Ballerup, Copenhagen DK-2750, Denmark <sup>1</sup>Wisconsin International University P.O. Box LG 751, Legon Accra, Ghana <sup>3</sup>Methodist University College Ghana Head, Department of Information Technology P.O Box DC 940 Dansoman Accra, Ghana annan@cmi.aau.dk



**ABSTRACT:** This paper present a case study report on the findings of an empirical study conducted at the Central University College (CUC) in Ghana on the use of "OUTSTART" mobile learning (m-learning) application for authoring m-learning content. The system use the familiar Microsoft power point with an added features which comes with authoring tools which is simple to use by teachers for creating m-learning content. The main objective of the study is to make m-learning content authoring very easy and simple for the teacher with easy to use tools so as to boost their stake in the use of mobile learning platform (MLP) for teaching and learning anywhere anytime. The result shows that the success of m-learning implementation and acceptance is partly dependent on the user friendliness, simplicity and easy to use applications by teachers. In all 90 lecturers participated in the project. The study describes and explains the implications of the findings, which have significant importance in relation to the issues of developing user centered mobile learning tools.

Keywords: M-Learning, Authoring, Content, User-interface, Teachers

Received: 11 August 2012, Revised 30 September 2012, Accepted 5 October 2012

© 2012 DLINE. All rights reserved

#### 1. Introduction

The focus of this paper is on teachers as m-learning content authors and users with core objective of make m-learning content authoring very easy and simple for the teacher with easy to use tools so as to boost their stake in the use of mobile learning platform (MLP) for teaching and learning anywhere anytime. The user friendliness, simplicity and easy to use m-learning authoring tools are partly contributing factors which can determine the acceptance and use of m-learning platform for teaching and learning is no doubt becoming a relevant method of learning which can be blended with the existing known traditional classroom face-to-face teaching and learning method. It is also suitable as a comprehensive learning platform for distance education without any physical classroom. M-Learning is actually showing strong indication of extending teaching and learning from a fixed location to a ubiquitous environment where by teachers can teach and learners

Journal of Information & Systems Management Volume 2 Number 4 December 2012 157

learn at anytime anywhere with any portable mobile computing devices. In the beginning, m-learning were no more than SMS of simple text which contained necessary information on specific subject areas or series of short notes. Although most m-learning still use SMS, currently we can find many such m-learning platform using XHTML, XML, WML, WAP, JAVA etc which have mobile learning engines (MLEs), mobile delivery engines (MDEs) and mobile authoring tools (MATs) for developing appealing and sophisticated content with video, voice, pictures, animations and more for learners. One issue with these m-learning applications that this paper is concern with is human computer interaction (HCI) and teachers [4]. Some of these m-learning applications do not have good HCIs and this often than not scare most teachers from using it to develop content to be used by students.

Sometime developing simple content can involve a lot of difficult time consuming steps so much that one will not like to use the same system a second time. Literature review done by this paper on m-learning shows that there are several m-learning pilot projects being conducted all over but very few among them have been able to go beyond pilot stage to full implementation [2]. This paper asserts that the teachers who are in most case as it were the main content developers do not find these m-learning applications to be as user friendly as it should since research shows that most of these teachers are not very skillful in the use of ICTs for teaching and learning. This paper observed that most research on m-learning concentrate on the system developers, learners, pedagogy and devices but not on the teacher. Thus little or no attention has been given to the role and relevance of the teacher who in actual fact is the content developer for the learner in this case. Academics devote a greater proportion of their teaching time to course content and its subsequent delivery [3]. Re-framing existing content into a mobile format takes an appreciable amount of resource allocation. It is therefore necessary when designing any mobile learning application to consider ease of use and usefulness to teachers as well as exploring the different uses teachers find for the tools, the contexts in which they use them and the learning materials they develop [6], [1], [5]. The following questions were asked to address the objective of the study. (1) How can we reduce the burden of teachers in authoring m-learning content by using the already unknown Microsoft power point application to author content suitable for mobile learning? (2) Will the use of Microsoft power point as m-learning tool increase teachers' interest in authoring mobile learning content for students?

# 2. General Description of the AD-CONNECT M-Learning Platform

AD-CONNECT's Mobile Learning Platform uses "*OUTSTART*" m-learning solution to rapidly develop, deliver and analyze content. Unlike traditional mobile content development, this Mobile tool allows you to develop content once (what we call single-source) and deploy it in multiple formats to multiple handhelds, mobile phones (Symbian Phones, BlackBerry, Windows Mobile Pocket PC's, iPhones, etc.) and tablets. With This Technology, you can:

Develop device independent mobile content using the familiar PowerPoint authoring environment with intuitive extensions for creating surveys, quizzes and assessments. This intuitive approach enables a broad range of Learning & Development professionals and Teachers to readily develop high impact mobile content. Device independent means you develop once and the system adjusts to the display factors for different devices. The ability to create mobile content independent of the mobile device allows organizations to save on content development but also provides faster time-to-delivery.

Deliver content to any internet-enabled mobile device without the need for customization. This includes mobile phones, smart phones, podcasting devices, and wireless devices. It fully integrates with existing corporate systems, provides the capability to set administrative rights to define module access, and facilitates sending SMS text and emails to students, staffs, parents etc.

Analyze the delivery and usage of mobile content in real time. Either standalone or through LMS (Learning Management System), it provides instant feedback as to your mobile content's use and effectiveness. Detailed reporting functionality includes user info as well as phone model used, time entered/exited, pages visited, questions taken/answered, score results, number of times content is accessed, and number of tries.

## 2.1 Key Features

1. Develop using the familiar PowerPoint development environment.

2. Mobile content features include: custom table of contents, right to left text, auto start multimedia,

video streaming, JAR video, J2ME/JAR results send, customize icon image, audio player J2ME/JAR, data collection, and background images.

3. Mobile content types include: Flash 7 and Flash 8, SVG, audio (mp3, amr, mid, wav, aiff, mmf, etc.), video (3gp, mp4, mov, etc.), tests (data captured), quizzes (practice), polls/surveys (data captured), images (all major types), text, numbered lists, and bulleted lists.

4. Create content for direct delivery to devices utilizing: J2ME & Java, Windows Mobile 6, Windows Mobile 5, and Windows Mobile 2003, Pocket PC 2002, and Palm OS v3.5+.

5. Track quizzes and tests through results, and track the number of times a specific piece of content has been downloaded, or which users are downloading content.

6. View online user activities in real time (Username, Course currently studying, and page number)

7. Automatic update to parents and guardian of student's activity.

8. Can be integrated to learning management system.

#### 2.2 Teaching

Facilitate Class Management

a. Teacher can create contents in regularly from PowerPoint Authoring tool Software from PC.

b. Upload contents to Mobile Delivery Engine.

c. Deliver to student through SMS or email.

d. Students interact of what they have understood from their mobile.

e. Interaction will be inside and outside the classroom.

f. Instructors measure class performance through Mobile tracking and Delivery System.

#### 2.3 Assessment

- Notification to students
- Delivering practice tests and home works
- Measure Class Quality and performance
- Teacher /Tutor Appraisal
- Increase response rate
- Increase information and knowledge retaining
- Lecture notes
- On hand review material
- Polls and surveys
- Automate all examinations for instant results
- Track what student does with the lectures notes

#### 3. Methodology

Central University College (CUC) in Ghana was used as a case study to seek empirical findings to the questions and to satisfy the objective of this paper. CUC has student total population of about 10,000 and teaching staff strength of 100 with a teacher to student ratio of 1:100. The school in March 2010 decided to introduce m-learning into the school's curriculum to complement the traditional classroom face to face teaching of large class sizes. To start the project an earlier version of AD-CONNECT m-learning platform was introduced in school but it did not yield the right results because the teachers who were supposed to be the content authors did not find the platform to be user friendly. Out of 22 lecturers who were used for the pilot project, only 2 of them were able to use it to create content after several months of training. This hindered the use of m-learning at CUC and compelled AD-CONNECT to develop alternative "*simple to use*" m-learning platform with user friendly authoring tools for the teachers. The "*OUTSTART*" m-learning application was developed and introduced at CUC in May 2011. With the new AD-CONNECT m-learning platform, "*OUTSTART*" is an "*add-on*" application with simple to use and user friendly m-learning authoring tools which is installed on Microsoft power point. The case study focuses on the 90 full time lecturers of CUC who were taken through training on the use of the new "*OUTSTART*" m-learning authoring tools for creating content. The "*PPT – OUTSTART*" plug-in application was installed on all the laptops of all the participants who took part in the five days training programme. With this new system one week training for the lecturers was enough. Two days for training on how to develop or

author content using the new added features of power point and three days for training on the content administration which involves publishing, assigning roles, uploading students details and course information etc. Observations, interviews and questionnaires were use in gathering both qualitative and quantitative data during the training and use of the "*OUTSTART*" m-leaning platform.

	Generation (Street Generation)	(Card) and the
2 2 2 2 2 2 2 2 2 2 2 2 3 0 4 4	Contract Acceler	
Total Jorgen Multiple Fill in the Ordening Matching Liked Ministering Medical Patient - Testa Annuel Annuel Bank - mart Quantum - Annuel Patient - Annuel Patient - Annuel	n Politika Tarihan Datanan Datanan	
Cick to edit Matter the style - to the to the state and - to the to the state and - to the total state and - to the total state and - total -	COURSE OUTLINE ECONOMICS	
Contraction of the second seco		
	Taval 200	
Character Name for long to Character Internet	LEVEL200	
	11/4/1011 Finder 4	
3 / V = = × / E	Co Addees	

Figure 1. Snap shot of the "OUTSTART" authoring interface embedded with Microsoft power point

Ca							Presentation1 - Microsoft PowerPoint					
9	Slide Master	Home	Insert	Animat	ions	Review	View	Add-Ins	OutSt	art	Acrobat	
20 True False	Single Multiple Answer Answer	? Fill in the Blank	?	2 Matching	? Likert	Streaming Media	External	Publish To Server *	Publish To File		Reset Edit Options + Help +	
	I	nsert Ques	tion			Insert	Object	Pub	lish		Options	

Figure 2. Snap shot of the "OUTSTART" authoring tools embedded with Microsoft power point

## 3.1 Observation

We paid particular attention in observing the participants verbal and non- verbal gestures, behavior, actions, attitude, comments, opinions and perceptions throughout the entire project. We were at the training sessions to observe how the lecturers were doing with the new power point mobile leaning authoring tools. We also did a follow-up by visiting them in their offices to see how they were using the authoring tools and its usefulness to them in creating m-learning content for students. We were also able to monitor the general performance of the lecturers on the use of the system by constantly tracking and following individual lecturers on the m-learning platform with the help of the tracking and feedback facilities which comes with the system.

## 3.2 Interview

We were able to interview 9 lecturers representing 10% of those who participated in the project with 4 from the economics department, 2 from physicians' assistance department, 2 from the counseling and family studies department and 1 ICT tutorial staff. The interviews were meant to help us gather individual personal opinions and perceptions on the new power point enabled mobile leaning authoring tools.

#### 3.3 Questionnaire

To help us in gathering some form of quantitative data, questionnaires were designed and administered to all the 100 participants. The purpose of this exercise was to obtain objective responses from the participants on their views on the new AD-CONNECT "*OUTSTART*" m-learning platform. The questionnaires were submitted to the participants on their mobile phones and emails using the survey and polls facilities on the "*OUTSTART*" m-learning platform. Out of the 90 questionnaires which were sent to the participants, we received feedback of 80 representing 89% of the total questionnaires administered.

## 4. Findings

The style of the research design provided us with two types of results in the form of qualitative and quantitative data analysis. The findings from the study led to the design of the "*STUMP*" model which is to serve as a guide to m-leaning system design & developer and implementers. The success of the training of the lecturers on how to use the new m-learning authoring tools was on the fact that the system was user friendly and the steps involved in creating content was minimal and easy to follow.

#	Some of the questions	Strongly agree = 5	Agree = 4	No opinion = 3	Disagree = 2	Strongly disagree =1
1	The " <i>outstart</i> " m-learning platform is user friendly	60(70.6%)	23(27.0%)	2(2.4%)	-	-
2	Less time and resources is needed for authoring	35(41.2%)	39(45.9%)	1(1.2%)	8(9.4%)	2(2.4%)
3	I can author content without supervision	13(15%)	20(24%)	-	52(61%)	-
4	It can support different pedagogies	5(5.9%)	56(65.9%)	15(17.6%)	6(7.1%)	3(3.5%)
5	It is simple and easy to use	58(68.2%)	27(31.8%)	-	-	-
6	You need little ICT skills to use the platform	54(63.5%)	31(36.5%)	-	-	-
7	The " <i>outstart</i> " tools have increased your interest to use m-learning platform	20(23.5%)	58(68.2%)	3(3.5%)	4(4.7%)	-
8	It is convenient to use	30(35.35)	47(55.3%)	5(5.9%)	2(2.4%)	1(1.2%)
9	Convenient Interoperability	59(69.4%)	22(25.9%)	2(2.4%)	2(2.4%)	-

Table 1. Result of survey

## 4.1 Qualitative Presentation

The first conspicuous observation which stands out in this study is the teachers increased desire to create content with the new "*OUTSTART*" power point m-learning authoring tools as compared to the previous m-learning system which was not user friendly and had a more difficult to use authoring tools. The enthusiasm of the lecturers was high as all of them attended the one week long training session. Majority of them were happy that they have to use the familiar Microsoft power point for the authoring of their m-learning content which was easier for most of them who were familiar with the Microsoft Power Point application. It was clear from our observation that the user friendliness and simple to use characteristics of the m-learning platform influenced most of the lecturers to appreciate m-learning as useful platform which can facilitate teaching and learning and serve as a complement to traditional classroom education. From the interviews we gathered from the interviewees that the power point embedded m-learning authoring tool is what teachers at CUC are comfortable with and are ready to use. One significant advantage of the "*OUTSTART*" m-learning tool was its interoperability functions which allow authors to easily convert already created power point document into suitable m-learning content for students anytime anywhere using any portable mobile computing device. Other responses from the participants were that the use of the Microsoft power point application with "*OUTSTART*" has obviously reduced the burden on the teacher making it easy and simple to author content. Five factors were identified from the study as what increased the teachers desire to use the m-learning system and such these

factors must be a guide to m-learning system developers and implementers if they want m-learning to be appealing to teachers who in this context are the main content authors without them learners will have no content for learning. These five factors are (1) The ICT *skills* of the teachers (2) The amount of *time* and resources needed for authoring content (3) The *user friendliness*, simplicity and easy to use tools of the platform (4) Varieties of *motivation* including support and encouragement from school authorities, effectiveness, efficiency and reliability of the system etc (5) The ability of the platform to support different *pedagogical* frameworks of teachers of diverse subjects areas.

## 4.2 Quantitative Presentation

The results of some of the questions which were administered have been analysed and presented in Table 1 and Figure 3. The table shows some of the questions which were asked and the responses that were given and the results show that user friendliness, easy to use, interoperability, convenient, pedagogical support and less time required and less ICT skills needed had positive responses of either "*agree*" or "strongly agree" figure 3 gives a graphical presentation on some of the questions relating to ability to author content with or without assistance.



Figure 3. Shows the authoring abilities of teachers after the training. Although the percentage of those who could author without supervision after the 5 days training is small it is an improvement over the previous m-learning application which was not power point based. It observed a follow up training will help the teachers to master the use of the system

"Stump" stands for **Skill**, **Time**, **User friendliness**, **Motivation** and **Pedagogy**. These are five main factors which were identified from the study as pressing issues to the teacher when it has to do with developing mobile learning application and implementing in schools. The details of the various factors will be properly explained in an upcoming related work. "STUMP" framework which presents the relevant needs of the teachers who are the authors of content for the m-learning platform. This must be a guide to m-learning system developers and implementers on what to take into consideration for ensure teachers interest in the use of m-learning authoring tools for creating content for learners.

## 5. Conclusions

This study provides relevant information to show that for teachers to be interested and willing to use any m-learning platform, m-learning application developers and implementers must consider the ICT skills of the teachers, time and resources needed at any given time to author content, the user friendliness, simplicity and easy to use characteristics of the platform, varieties of motivation which includes effectiveness, efficiency, technical support and reliability of the platform and also support,

encouragement and incentives from school authorities, and finally the ability of the m-learning platform to fit the pedagogical framework of teachers.

The questions of the study were answered satisfactory from the findings which showed that the burden on teachers when it comes to authoring m-learning content can be reduced tremendously if a familiar application such as Microsoft power point can be used for authoring m-learning content for learners and it was also realized from the study that will go a long way in boosting teacher interest in using m-learning platforms for teaching and learning anywhere anytime.

#### References

[1] Attewell, J. (2005). From Research and Development to Mobile Learning: tools for education and training providers and their learners.

[2] Guy, R. (2010). Mobile Learning: Pilot Projects and Initiatives. Santa Rosa, California:: Informing Science Press.

[3] Hoorebeek, M. V. (2010). Content Creation and Delivery Devices: Thoughts Concerning Mobile Learning and Teaching Practices. p. 27-43.

[4] Madeira, R. N., Sousa, J, L., et al. (2009). A mobile and web-based student learning system. *Procedia social and behavioral science*.

[5] Milrad, M. (2006). How should learning activities using mobile technologies be designed to support innovative educational practices?

[6] Naismith, L., Corlett, D. (2006). Reflections on success: a retrospective of the. Mlearn Conference Series, 2002 -2005., *In*: Across Generations and Culture, Mlearn 2006 Book of Abstracts, p.118 -200. Banff. Canada: Mlearn.